THE FOUNDRY

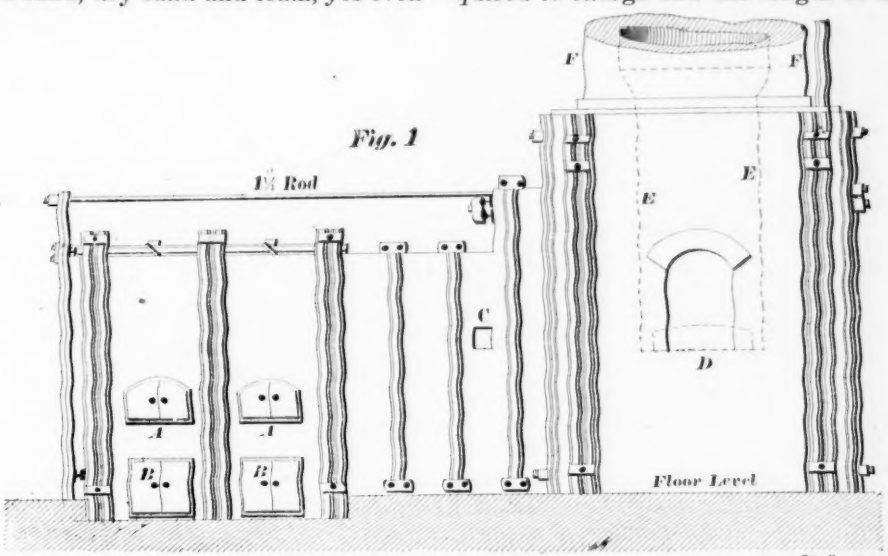
VOL. 2. DETROIT, MICH., JUNE, 1893. No. 10.

REVERBERATORY FURNACES.

BY JOHN PETTIGREW.

I HAVE often heard the question asked of late, why don't we see anything about the air furnace in our foundry trade journals? We see about cupolas and cupola practice, about moulding in nearly about all its branches, green sand, dry sand and loam, yes even core making comes in for its share of talk, but no one seems willing to talk up this branch of the foundryman's trade. While talking over this subject with some friends, one of them propounded the question, then why don't you make a beginning? The question coming home so forcibly I thought I would try and put in readable shape what little I knew about an air furnace. Until a very few years ago an air furnace has been a very rare thing in the foundries of the Western States, due partly to a want of appreciation of the superior quality of the castings made from iron melted in the air furnace, and also to the great outlay of money required in its erection when compared to the first cost of a cupola, also to the much greater expense incurred in the working of the furnace, for taking the weight for weight of iron melted, the cost for fuel, the time required to charge and the length of time to melt a given quantity, all these items are much greater in the air furnace than in the cupola, but the superior quality of iron produced counterbalances all this extra expense. For instance, the ordinary iron from a cupola has a tensile strength of from 15,000 lbs. to 16,000 lbs. per square inch, whereas that melted in an air furnace will have a tensile strength of from 27,000 lbs. to 33,000 lbs. per square inch, or take another illustration, take the case of a hydraulic cylinder which has to stand a

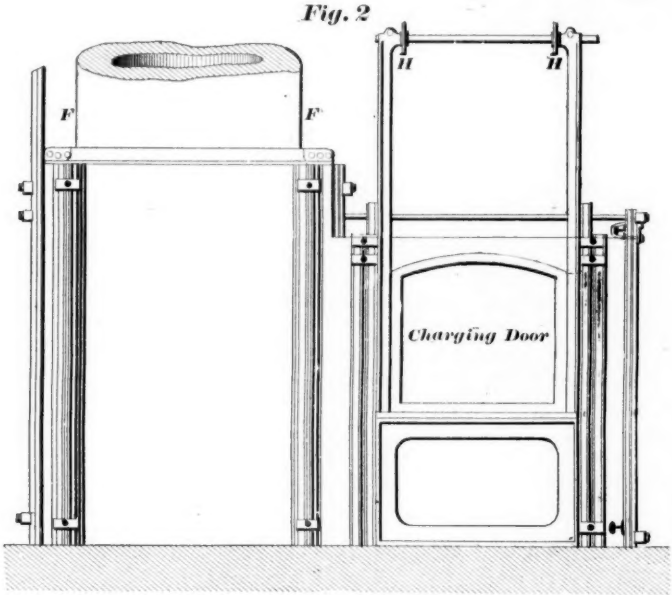
Fig. 1



Side Elevation

pressure of 400 lbs. to the square inch, using the same quality of iron and cast one from the cupola, the grain of the iron will appear quite open and rough when finished, while the appearance of the one cast from an air furnace will be close and fine, but the vast difference will be shown when the pressure they are required to stand is put on; the one cast from the iron melted in the cupola will sweat all over and most likely very fine streams of water will flow from some part of it, while the one cast from the air furnace will not show any sweat, and if you did not see for yourself you would not know that there was either water in it or pressure on it; or take two rolls for such work as we do in our ordinary steel mills, still using the same quality of iron in both cases, one cast from the cupola will be chilled all along both joints where the parting is made, making it almost impossible to turn the rolls true, the iron will have a very mottled appearance, little gray spots showing all over the surface as if they were held in a net of white iron, making a very undesirable rough surface when the rolls have been in use for a very short time. Now take the rolls cast from the air furnace, there is no chill along the joint, the iron has a fine, silken, uniform, homogenous look, the wearing when in use is even all over the body, it will stand a very many larger number of sudden blows and strains without breaking. In fact, is a very superior article to the cupola product. It is mostly for this reason that all foundries of any size in Great Britain have one or more air furnaces as part of their plant. It is a very rare thing to see an engine bed, or cylinders of any size, and more especially marine work, made from any other than the air furnace. I speak more especially of Glasgow where I have seen a great many of them cast, where, besides the iron charged in the air furnace, they would melt a large proportion in the cupola and transfer it to the air furnace in a liquid state where it would be held for a couple of hours subject to the intense heat of the furnace, being thereby refined and strengthened. For by maintaining the iron in fusion for shorter or longer periods of time is generally attended with a corresponding improvement in the tensile strength of the product. I have a record of experiments which might be very well introduced here, showing the vast increase in density and tensile strength gained by iron

Fig. 2



End Elevation

The Foundry

held in fusion for different lengths of time. Showing the wide field for improvement which the mere difference in the mode of reduction and time of melting offers to the consideration of the practical foundryman.

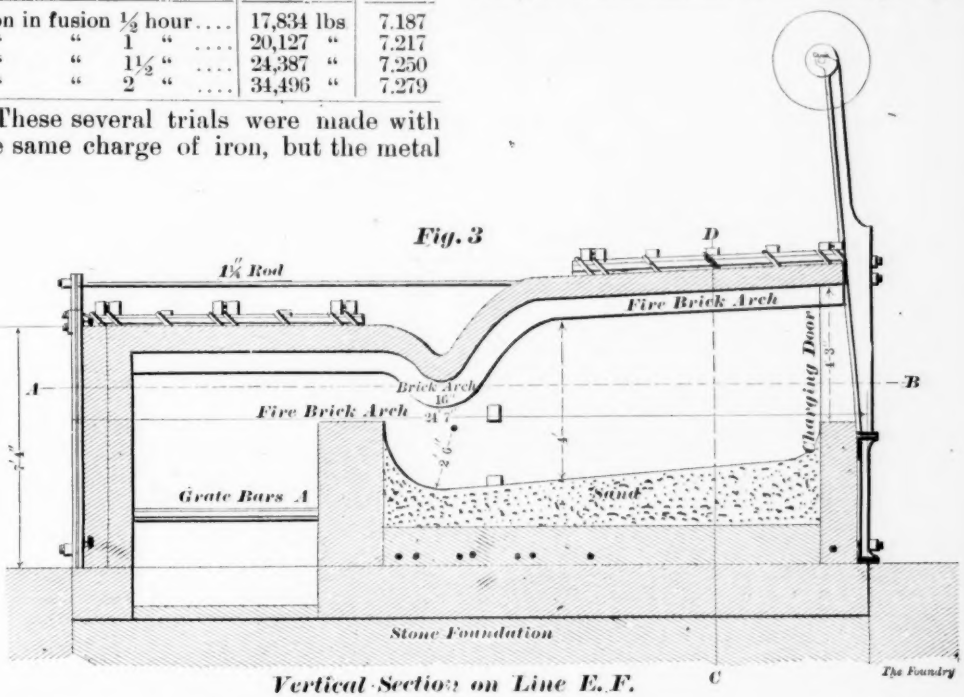
	Tensile strength per square inch.	Density
Iron in fusion ½ hour....	17,834 lbs	7.187
" " 1 "	20,127 "	7.217
" " 1½ "	24,387 "	7.250
" " 2 "	34,496 "	7.279

These several trials were made with the same charge of iron, but the metal for testing was taken from the bath at the different times stated, making the test one of the most accurate possible. The reason for this great increase of strength gained by the above process might be the exposure of the reduced iron to a current of air containing free oxygen, resulting in the elimination of carbon, silicon, sulphur and phosphorous. The first in the gaseous combination, the rest in the slag produced in the process. The temperature of the molten iron in the basin cannot be equal, being hottest where the flames are fiercest, consequently currents must be produced which gradually brings the entire mass of the metal under the refining influences of the current of gases constantly passing through the furnaces.

The air furnace, unlike the cupola, is so constructed that all the iron charged is melted without coming in contact with fuel, it comes under the same class as the puddling and heating furnaces, the flames and heat being reflected or reverberated from the arched roof which should in all cases be built without any straight lines as the structure has to stand a great amount of heat kept up for a long time with heavy bodies of iron in it, the expansion of the brick together with the weight carried requires that the structure should be of great strength, consequently it is surrounded on all sides except the top with heavy cast iron plates, or better still with wrought Iron plates, braced every two feet with heavy beams of rails held together by strong rods running across the furnace both above and below.

There is a great difference of opinion as to the proper shape of the inside or place where the iron is piled for melting so that a given quantity of fuel will do the most effective work. Different engineers and foundrymen have different ideas on this point. The accompanying illustration, *Fig. 3* gives an idea

Fig. 3



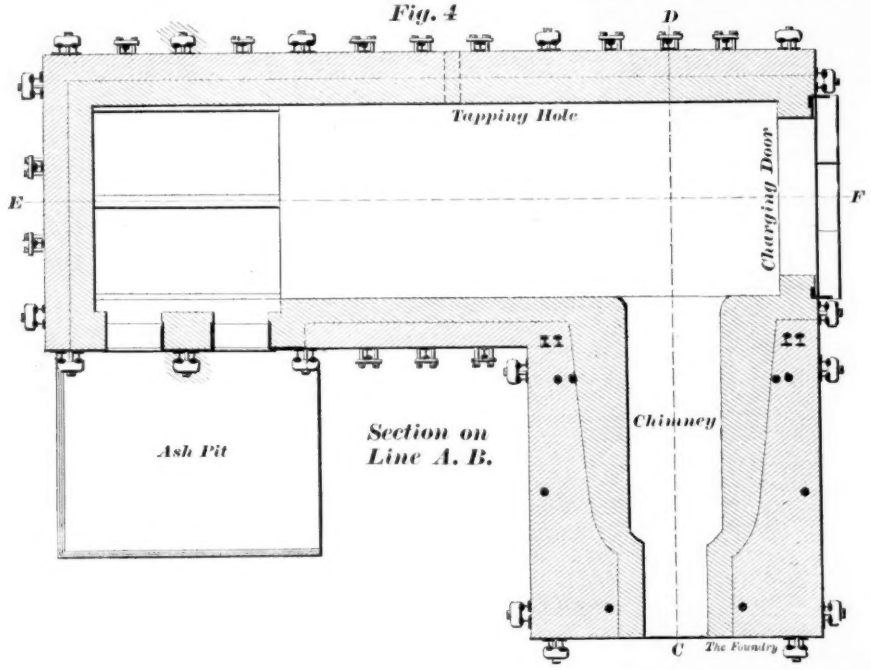
Vertical Section on Line E. F.

of the best form of furnace used for this purpose. It will be seen that the bed of this furnace can be used all over. The charge of iron can be piled from the bridge wall to the charging door, getting the full benefit of the flame and heated gases from near the place of generation to the chimney flue. This furnace will hold fifteen tons of iron, being easily charged with metal in comparatively large bodies, such as heavy cannon or old rolls or pieces of any size that will go in the charging door. This is a great advantage, as it saves time and money, the pieces not needing to be cut up or broken small, to be charged as they require to be where the charging door and floor are small, and where the place for receiving the molting iron is deeper and pot-shaped, precluding the possibility of putting the pieces where the flames will reduce it to a molten state quickest.

The charging door is at the end of the furnace intead of being on the side, by this arrangement the charging can be started at the bridge wall and gradually carried forward. Quite large pieces can be put in directly below the velvetring the charging door to the top of the bridge wall. The height of the bottom can be regulated according to the size of the heat required to be made by filling in with fire sand, such as is used in all heating furnaces. The fire chamber ought to be, at least, 6" wider than the body of the furnace. Experience teaches us that the larger the chamber within due bounds the better will the furnace work. The material of which the furnace is built should be the best fire brick obtainable, it will be by far the cheapest in the long run. Any cracks or holes by which air can enter the furnace should be thoroughly stopped and the place all around examined to see whether the walls are getting which gives the flames a downward direction immediately on leaving the fire chamber, a mass of iron at this spot is very quickly melted up and is kept hot by the intense heat always present at this part of the furnace, making a fine bath into which the iron that is last in melting can be can be poled if it is not desired to do any more than merely melt the iron.

The chimney and flue are on one side, the bottom of the flue being about 3" above a line drawn from the foreplate of

Fig. 4



loose or any deterioration in the material going on, because air getting into the furnace by any other place than through the fuel in the fire chamber, will cause a great loss of iron by what is commonly called burning.

The furnace should be carefully examined through the small door placed in the side and generally on the large door for charging, where any place which draws air can easily be seen. These small doors just spoken of are always used for poling the bath before tapping, this process thoroughly mixing the iron. They are also used for breaking down the lumps that are hard to melt, pulling the jackets off and setting them afloat in the molten bath, hastens the melting materially. The chimney of this furnace is very large in inside diameter, but it is not any too large for the work required of it.

Like everything else the better the study made by the workman in the use of his tools the greater the success achieved, so the more the watchfulness and carefulness bestowed on the air furnace by its superintendent and keeper the nearer perfection will be the result of their labor and the less trouble will they have in accomplishing a given object.

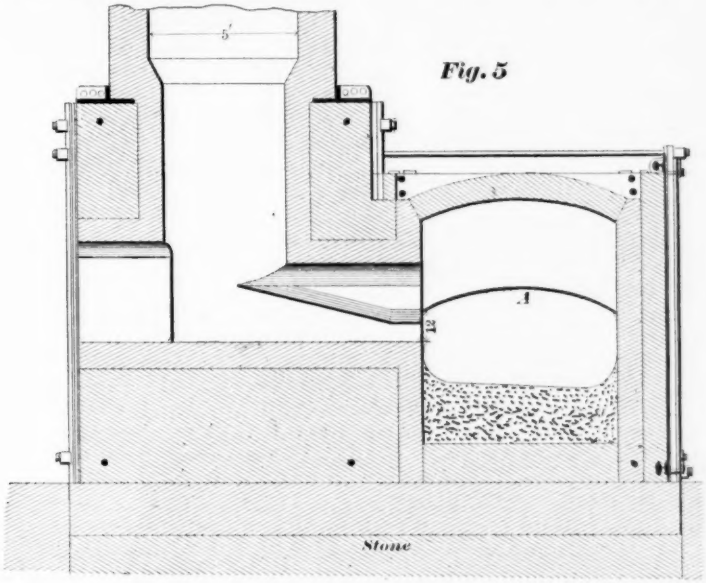
It will be seen that Fig. 1 is a side elevation and shows exterior of furnace with doors for fuel, and at A A and for extracting ashes at B. B ; C is puddling hole covered with a small, air-tight door lined with fire brick or clay, etc., while at D are shown dotted lines the size of flue to permit the escape of smoke into the chimney, it being 3 ft. broad and 6 inches high at ends, arching to a height of 12 inches in center. Dotted lines E E represent the interior of chimney.

Fig. 2 is end elevation showing chimney F F with pulleys H H for hoisting door by means of weight. Fig. 3 is a cross section through center of furnace and gives a few of the principal dimensions showing a part of stone foundation under furnace and the "bed" of sand inside, which as previously mentioned can be built any size desired.

Fig. 4 is a cross section through line A B (in Fig 3) and shows a sort of "ground plan" of furnace, chimney, etc.

Fig. 5 is a view of line C D (in Fig. 4) and shows bottom of chimney, flue, etc., while Fig. 6 is simply a sectional end elevation showing interior of furnace and exterior view of chimney. Owing to the size of cuts it has not been possible to show dimensions except in a few instances, a general view being all

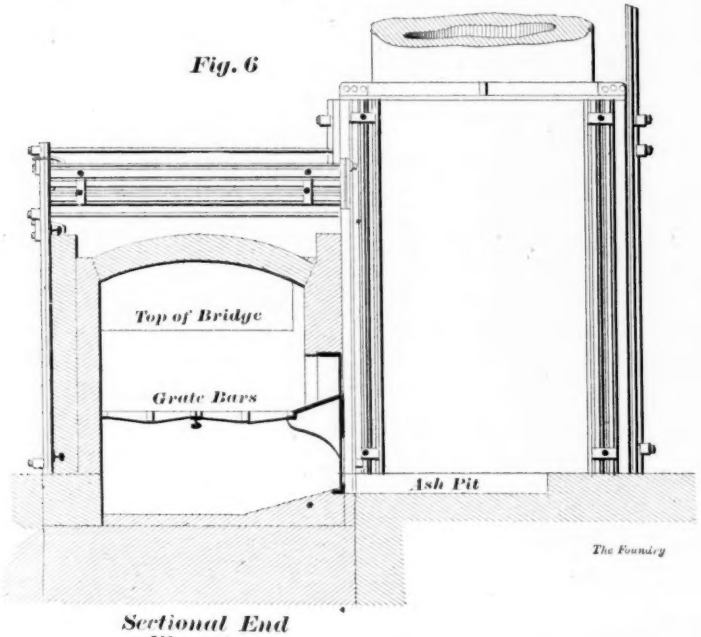
Fig. 5



Section on Line C. D. The Foundry

that has been attempted and the illustrations submitted show very clearly the principle and plan of what has proven itself to be as good a furnace as the writer has ever seen, while it certainly possesses some valuable features that the others are without.

Fig. 6



Sectional End Elevation

THE LEAD PENCIL BETTER THAN PEN.

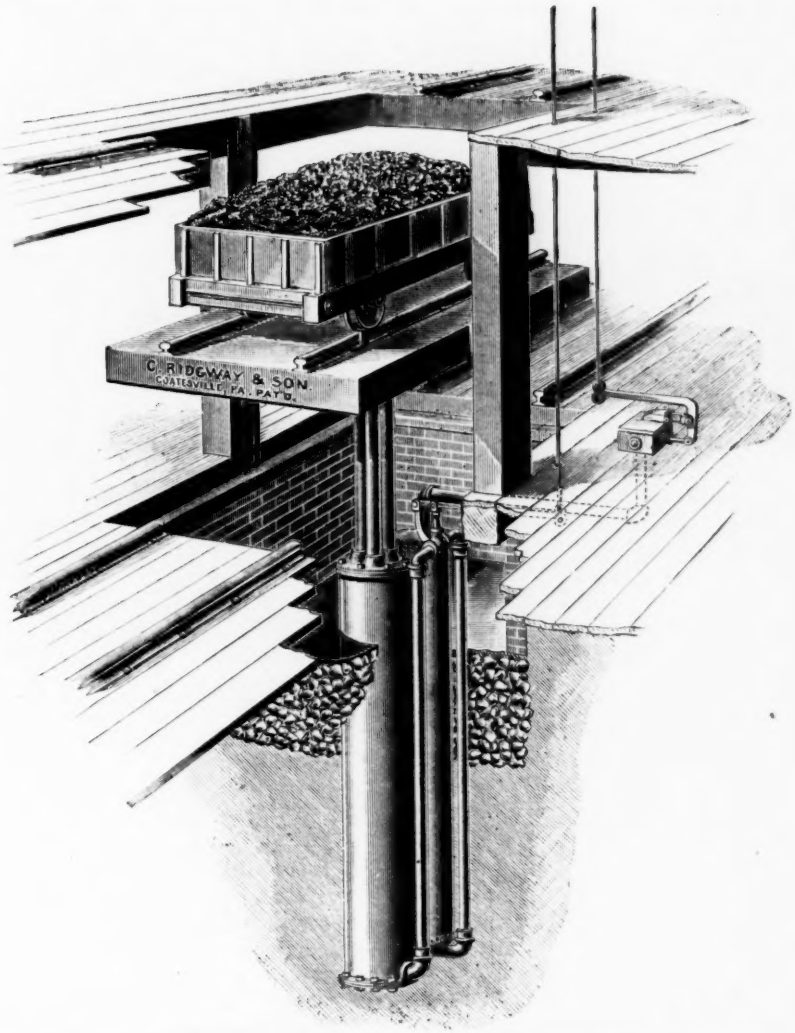
EX-PRESIDET HARRISON, whose handwriting is a clear, precise and neat as that of a women, said, after writing his annual message with a lead pencil, "My thoughts flow more freely from the pencil." Other eminent men, who have felt the weight of great responsibilities, have been conscious of nervous irritation, mental friction and general exhaustion when using a pen, and an almost entire freedom from such ills when using a pencil with a smooth and easy yielding lead. General Grant, in writing his important papers, used a Dixon "American Graphite S M" and commended it for its unequaled qualities.

The use of a lead pencil has saved many a writer from penman's cramp, and made it possible to do better work with greater ease.

THE RIDGWAY STEAM-HYDRAULIC ELEVATOR.

THE Ridgway steam-hydraulic system for the handling of heavy weights, and with which most of our readers are familiar, has been applied to elevator service. The accompanying cut shows this method applied to an elevator of the kind usually employed for taking up stock to furnaces and cupolas. It will be observed that the motion of the piston rod is doubled and that the cage is supported by a single strand of chain. In machines of larger capacity the chain is always doubled and each strand is of ample size to safely support the maximum load. Wire rope is used when preferred and any number of strands can be employed. The same principle is also used in a direct connected elevator in which the platform is placed upon the piston rod. The style illustrated is that most urged by the builders, Craig Ridgway & Son, of Coatesville, Pa., because all the parts

are upon the surface of the ground and are always under the eye and readily accessible. The space required for the cylinders is so small that there are few situations in which it cannot be afforded.



It is not at all imperative that the cylinders shall be placed by the side of the elevator well; they can be set anywhere, even quite a distance away. The builders mention as a very important advantage the fact that the elevator is unlimited as to speed. The foreman in an instant can set it at any desired speed and then place it in the hands of an ordinary laborer, who cannot operate it any faster than the speed at wnich it may be set. Sudden throwing of a full head of steam on an empty elevator makes no difference, as it moves at same set speed whether empty or loaded. It is claimed that this elevator is far more economical in the use of steam than any of the usual types of hydraulic elevators. These elevators are also made for passenger service and are built of any capacity up to 25 tons and for any desired height of lift.

It is said the Sweat Mfg. Co. Medina, N. Y., comtemplate moving their foundry so Middleport, N. Y. and expect a bonus from citizens of the latter place.

THE FOUNDRY

A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

Published Monthly by

"The Foundry Publishing Co."

172 Griswold St. DETROIT, MICH.

DETROIT, JUNE 10TH, 1893.

Entered at the Post Office at Detroit, Mich., as second-class matter.

SUBSCRIPTION—One Dollar and fifty cents per year in advance in United States, Canada or Mexico; one dollar and seventy-five cents per year to all other countries. May be sent by express, draft, money order, registered letter or postage stamps. Single copies, 15c

CLUB RATES—Eight or more subscriptions sent at one time, $1.25 per year each. Cash to accompany order.

Advertising rates furnished upon application.

SUBSCRIBERS can have address changed as often as desired.

IF YOU FAIL to receive your paper promptly, please notify us.

THE FOUNDRY is issued promptly on the tenth of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

The Detroit News Company,

Publishers' Agents, Detroit, Mich.

DEALERS SUPPLIED BY

The Albany News Company, Albany, N. Y.
The Baltimore NewsCompany, Baltimore, Md.
The Brooklyn News Company, N. Y.
The Buffalo News Company, Buffalo, N. Y.
The Central News Company, Philadelphia, Pa.
The Cincinnati News Company, Cincinnati, Ohio.
The Cleveland News Company, Cleveland, Ohio.
The Colorado News Company, Denver Colorado.
The Detroit News Company, Detroit, Mich.
The M nnesota News Company, St. Paul, Minn.
The Montreal News Company, Montreal, Canada.
The National News Company, New York, N. Y.
The Newark News Company, Newark, N. J.
The New Orleans News Company, New Orleans, La.
The New England News Company, Boston, Mass.
The New York News Company, New York, N. Y.
The Northern News Company, Troy, N. Y.
The Omaha News Company, Omaha, Neb.
The Pittsburg News Company, Pittsburg, Pa.
The Rhode Island News Company, Providence, R. I.
The San Francisco News Company, San Francisco, Cal.
The South West News Company, Kansas City, Mo.
The St. Louis News Company, St. Louis, Mo.
The Toronto News Company, Toronto, Ontario, Canada.
The Washington News Company, Washington, D. C.
The Western News Company, Chicago, Ill.
The Williamsburg News Company, Brooklyn, E. D., N.Y.
The Wisconsin News Company, Milwaukee, Wis.

GO AND SEE IT.

THE FOUNDRY has not heretofore had much or anything to say concerning the great World's Exposition whose fame is and has been for so long the main topic of public interest in America, if not in many sections of the world. This has been largely owing to the fact that the daily papers have covered the ground so thoroughly and the subject has been so well advertised and illustrated on every hand and by every modern and original method, that we have refrained from attempting to add anything to what was being already well attended to by those who were on the ground.

Since our last issue however, a representative of THE FOUNDRY has paid the Fair a brief visit and we believe it due to ourselves and our readers to give them a few of our impressions.

It is a magnificent, a stupendous success. Nothing that has been said, written, thought, imagined, or dreamed of, can ever do it justice. It is unquestionably the greatest achievement of its kind in modern times, and only those who do not see it will be sorry. To the thousands of those who are in doubt as to whether they will go there or not, we would earnestly say GO. Let no consideration that you can possibly overcome keep you away. If you are of an appreciative disposition at all you will consider yourself repaid for your journey by a visit to some one alone of the main buildings. It is worth not alone the fifty cents admission but fifty cents an hour to any man or woman who can place their hands on that amount of money and will be even then the very best investment that could be conceived. The grounds are so large, the transportation facilities by train, elevated railroad, cable-cars, and boat lines so ample, leaving as they do almost every minute for the grounds that no crowding is possible.

The stories that have been sent out by sensational writers about high living rates are pure falsehoods. We saw none of it. The hotels have advanced their rates from 25 cents a day upwards, but it is nothing and there is plenty of room while thousands of private families are in the field to rent very comfortable accomodations and the fact is that this immense competition is going to make accomodations very cheap. Table board is as cheap as it ever was and far cheaper, quality considered, for a first-class meal than in many other large American cities to-day and those

who have been expecting to get rich at the business during the exposition are doomed to disappointment. In conclusion we say again, GO. The opportunity is not likely to be again yours. It will elevate, educate, broaden your ideas, no one is too busy; if you had but thirty days to live, you could not devote the time to better advantage in preparing for the next world than in viewing all that is best and grandest in this. GO.

GIVE THEM A CALL.

THE Chicago Foundry Supply Co. have secured a permanent down-town office at 503 Teutonic Building, Cor. Washington and 5th Ave, Chicago, where they will be glad to have a visit from every foundryman or any of their friends during the Fair.

They extend a cordial invitation to all to pay them a visit and make themselves at home. Telephone, Stenographers, plenty of stationery and a splendid place to have mail addressed to are among the inducements offered.

The Detroit Foundry Equipment Co. have also a very fine suite of offices, cor. of Quincy and Dearborn Sts. opposite the Post-office near all leading hotels and very centrally located as regards depots where they have all the trade papers, large reading room, etc., stenographers, telephone, stationery, etc. They have also made arrangements for promptly furnishing visitors with comfortable lodgings either at hotels or private houses and have a large list well situated, to select from. In addition they have had prepared the best map of the Fair Grounds we have seen yet, giving every building and objects of interest and much information concerning the various approaches, etc., which they are mailing to their friends; if you have not yet got one, write for it by return mail. They invite every one to call and have all mail addressed to their care.

A SUCCESSFUL GATHERING.

THOSE who have been been instrumental in bringing together the gentlemen who organized the Western Foundrymen's Association in Chicago, May 25th, have reason to be pleased at the result of their labors, and while the attendance was of course at the preliminary gathering limited, yet it contained representative men from all sections of the country and all branches of the business. It will be a most successful organization from the very start as it contains those with whose name the word "success" has been, and is, inseparably linked and many more will become affiliated regulary at each meeting. That the foundry interests have been more or less neglected and that there is a great demand for more general knowledge on the subject is evidenced by the very existence of these Associations in various sections of the country, and the amount of interest taken in their proceedings and they are right in line with the ideas so often expressed in these columns. THE FOUNDRY will do all in its power to help along the good work both by printing that which will interest its readers most in their proceedings and by aiding it in every other way, that only such a representative paper as this is, can.

THE FOUNDRYMENS' ASSOCIATION

MINUTES of the twenty-fourth meeting of the Foundrymen's Association, of Philadelphia, was held at the Manufacturers' Club, Philadelphia, Wednesday evening, May 3rd, 1893, at 8 o'clock.

In the absence of the president Mr. Walter Wood, of R. D. Wood & Co., Philadelphia, took the chair.

The minutes of the last meeting were read and adopted.

The following were present:

Thomas Hobson, *Iron Age* Philadelphia; L. B. Whitney, A. Whitney & Sons, Philadelphia; A. W. Howe, Davis Coal and Coke Co., Philadelphia; J. S. Stirling, Harlan & Hollingsworth Co., Wilmington, Del.; W. S. Messick, Pusey & Jones Co., Wilmington, Del.; J. Hy. Pepper, *Iron Age*, Philadelphia, Pa.; Walter Wood, R. D. Wood & Co., Philadelphia, Pa.; E. M. Mumford, Hy. R. Worthington, New York; George. A Register, J. Register & Sons, Baltimore, Md.; A. McArdell, Pond Machine Tool Co., Plainfield, N. J.; J, Thompson, J. Thompson & Co., Philadelphia, Pa ; E. E. Brown, E. E. Brown & Co., Philadelphia, Pa.; J. M. Warner, Rogers, Brown & Warner, Philadelphia, Pa.; Geo. P. Smyser, E. G. Smyser's Sons, York, Pa.; W. H. Pfaehler, Abram Cox Stove Co., Philadelphia; Chas. T. Holbrook, Juniata Furnace and Foundry Co., Philadelphia;

Wm. Wark, Diedelt & Eisenhardt, Philadelphia; George W. Flagg, S. G. Flagg & Co., Philadelphia; W. H. Fairlamb, Wilmington, Del.; Howard Evans, J. W. Paxson & Co., Philadelphia, Pa.

The night was very stormy which caused a small attendance.

The Executive Committee reported that they were pleased with the proceedings of the April meeting, particularly with the address of Mr. Jones Wister on the subject of coke, and it is the intention to have similar addresses on various subjects presented before the association as frequently as possible. Our idea is, that it is the proper plan to pursue, it explains in an informal way matters of interest to the foundrymen, saving his time in reading and studying up the different subjects.

The discussion on labor and immigration then took place. Ten to fifteen years ago the Irishman was the street cleaner or the Dago of the day. His place was taken by the Italian. To-day we find a lower class of labor, the Polock or Poles, who are the Dago of to-day. The Irishman occupies a higher level of industry. He makes a good blacksmith, an excellent machinist and a splendid moulder. His stay in this country has improved him and they form a valuable addition to American industry. The Italian we find also on a higher level. They are often found in our factories and foundries as laborers. They are an economical people and their residence in the United States has improved them as well as their pocket book. It is not an uncommon thing to see the Italian wearing the clothes of a gentleman, which is the very evidence of thrift and refinement. The Poles are coming to our shores in large numbers and are taking the place of the Italians as street cleaners. After they have been here for a time it is quite likely their places will be taken by the Russian Jews who are also coming to our shore in large numbers. This tells us that America is the place for the foreigner who finds abundant labor and at prices far in advance of any other country. It is our opinion that low prices have been brought about by competition and bad guessing to a great extent. Another cause being over-production, in other words foundries have increased to a greater number than there is customers. That being so an improvement must be looked forward to. The rapid rate at which this great country is growing and the demand for castings being greater, it is fair to suppose that a comparatively short time only will be required to take the production, when one foundry after another who are full of orders will take new ones at advanced rates. This will be an acceptable coming and the sooner the better.

This is one important point that must not be forgotten, there is no other article to take the place of cast iron, therefore there is no diminution as to its use. Its place has not been filled by a substitute of less value. Steel castings, of course, are used where great strength and light weight are required. The price of steel castings has been getting lower and lower. In fact, about five years ago the price of gray iron castings was about the same as steel castings of to-day.

The treasurer reported $355.65 on hand and all bills paid to first of May. Mr. E. M. Mumford, of the Worthington Hydraulic Works, Elizabethport, N. J., and L. B. Whitney, of A. Whitney & Sons, Philadelphia, compiled the following circular which is to be distributed in the various sections of the country where new foundry associations have been formed or forming.

The treasurer reported the balance in hand to be $355.65.

R. A. Register, of Register & Sons, Baltimore; L. B. Whitney, of A. Whitney & Sons, Philadelphia, and E. E. Brown, of E. E. Brown & Co., Philadelphia, reported progress of their respective sections of the Price Committee.

The secretary announced with regret the decease of two members of the association—Wm. H. Green, of the Vulcan Iron Works, Chester, and Edmund Grinnell, of the New Bedford Iron Foundry, New Bedford, Mass. These, he stated, were the first members of the association removed by death. Mr. Green had attended nearly all the previous meetings of the association and was personally known to most of its members.

The secretary read communications from Cleveland, Ohio, Grand Rapids, Mich., and other sections, expressing appreciation of the objects and aims of the association and the interest taken by foundrymen in the West in its proceedings, and asking for information with a view to the formation of similar associations as subsidiary organizations. The correspondence evoked much discussion.

E. H. Mumford thought some scheme for centralization of the subjects and matters discussed at the meetings of this and other associations should be promoted, so as to be generally available to all interested. He believed that debates on previously arranged subjects could be conducted simultaneously at the different points.

The chairman suggested that it would be well for the other associations to send the papers they proposed to consider at their meetings to this association, that the ideas promulgated might be further discussed and disseminated. He thought great value would attach to a centralization committee which would take charge of the different branches and thus forward the extension of the work of this association. He would be glad to have the question thoroughly discussed and a committee of sufficient size appointed to keep the movement going throughout the country.

L. B. Whitney thought that before a committe could be appointed it would be necessary to secure the co-operation of the branches, and in that way hold them closer.

The chairman was of the opinion that the subject necessitated a good deal of consideration. He thought that it would be advisable for the sections proposing to form sister organizations to send some one to represent them at a future meeting. After further discussion Mr. Mumford moved the following invitation be sent to the promoters of other associations :

The awakened interest in foundry matters is evidenced by the formation of numerous local societies throughout the country for the discussion of foundry practice.

The Foundrymen's Association, with an idea of centralizing and making mutually more available and valuable to the foundrymen of the whole country and especially to the various organizations now formed or forming among them, the most advanced ideas of foundry practice, proposes as follows :

1. At the next regular meeting of this association, to be held in Philadelphia, on Wednesday, June 7th, 1893, its members will discuss the plan of laying out a line of topical discussion to be jointly carried on by foundrymen in their various local organizations all over the country and regulated, perhaps, by a committee. The idea is suggested of having the discussions carried on at different places simultaneously and then embodied in a publication which shall be, in a sense, a nucleus and bond between the various organizations and a return of value for membership dues.

2. That your home organization be invited to contribute its views of this plan, either by letter or by personal representation at the meeting mentioned above.

3. That in this way the foundrymen of the country may be virtually united in a common interest.

Your earnest co-operation is solicited.

The motion was carried unanimously.

Mr. Howard Evans, of J. W. Paxson & Co., Philadelphia, then read the following address on foundry facings which was listened to with marked attention and after he had concluded was given a vote of thanks by those present :

Mr. Evans said: "The time that foundry facings was first invented and the foundry that used it first may be an important fact if we were discussing history. But, as the Foundrymen's association are looking for information more particularly as to the using of it, we will start under the head of "The Reason for Its Use and What is Expected of it, and How it is Made." That which is used most is known as bituminous or seal coal, which is mixed with the sand and makes what is known as facing sand. The object gained by this procedure is to keep the mould from bursting. The hot metal burns out the facing and turns it into a gas which allows the heated air to penetrate the sand and pass off, leaving the mould in

its original shape. This gives form to the casting. It will be noticed that the escaping gases after being fired by a torch burns with a blue flame in the atmosphere because of the oxygen of the air coming in contact with it forming a gas somewhat similar to our illuminating gas, which is known as C 4 H 4, or four parts of hydrogen and four parts of carbon. This bituminous or sea coal facing is made from soft coal, such as is used for making gas in our cities and towns. The larger percentage of bitumen and the less amount of dirt which it contains being an important factor, therefore the purer it is the less it takes to perform the object to be gained. In large castings weighing one ton or over made in green sand it can be used to an advantage if ground a little finer than mustard seed, as the escaping air must pass off quickly. In lighter work, such as small pulleys, bench work, etc., this facing should be ground very fine as the air will escape very gradually and evenly. As far as the quality of this kind of facing is concerned there is not much difference as made in the various mills as there is in what is known as fine facings, therefore bituminous or sea coal facing is only used to mix with the sand. The purer and larger percentage of bitumen it contains the less amount of it is required and the better casting it will make.

FINE FACINGS.—This is where the miller's art excells in making the proper fine facings. It is made from various refractory materials that will stand the extreme heat in the mould, keeping it from burning into the sand. My idea as to the working of this facing is, that if one salivate on a red hot stove, he will notice a bubble is formed which slides off the heated surface. There is an atmosphere existing between the bubble and the stove which is steam. There are various theories expressed regarding this matter, but I think it is a well-known fact that when fine facings are used on the inside of the mould and the heated iron or metal comes in contact with it, there exists immediately an atmosphere between the facing on the mould and the metal which keeps the iron separate from the mould. When the sand is taken from it, it will be found that it has peeled off, leaving a clean surface. All the best quality of these fine facings is made from plumbago, that which is known as E. India plumbago being the best, at least, there is probably more of it sold where fine castings of clean surface are required than any other brand. Other qualities of castings are made from various mixtures, some using soapstone, anthracite, coal, carbon, coke, charcoal, fire clay, asbestos, minerals, etc., every mill grinding facings having its own mixture which is supposed to be a secret. Under ordinary circumstances the finer and more regular it is pulverized the better. The best grades being bolted through a very fine silk cloth running about two hundred meshes to the inch. In fact, the intention is to make it as nearly an impalpable powder as possible. These facings are placed upon the mould with a bag and slicked with a tool or the hand and the mould blown off with a bellows so there will be none of it left loose for the iron in passing over the mould to pick up and deposit in some part of the coke where it might make an imperfect casting. Where it is necessary to return the pattern to make what is known as print work, like stove castings, etc., it is found of advantage to dust on the mould, which has been previously covered with a heavy dust, charcoal or return facings, which prevents the heavy dust of a plumbagonous nature from sticking to the pattern, as the natural dampness of the sand has a tendency to make the heavy dust of a pasty, sticky nature. The charcoal absorbs the moisture and allows the pattern to be taken out of the sand, leaving it clean, and when the metal is poured and taken out of the sand it should have a beautiful, even, dark grey or bluish color, making the stove an ornament to the house which it occupies. The making of stove plate facing is considered an art, as the different shops vie with each other and strive to make cleaner castings of a better color than his neighbor. The castings must be thin and of large surface, some of them being only $\frac{1}{8}$″ in thickness. From this fact it is not necessary to use bituminous or sea coal

facing, as the amount of metal used can find vent without its aid.

Another facing which is used for cast iron, water and gas pipe known as blacking, is used probably more than any other of the fine facings, as the surface to be covered is large and the immense number of pipes made occasions the great demand. This facing is used as a wash, being mixed with clay water to the consistency of a cream and placed upon the mould. The better grades of this facing or blacking are made from superior qualities of coal from the Anthracite district, which are selected on account of the large amount of fixed carbon which they contain. Unless it will analyze as high as 85% of fixed carbon and less than 10% of ash it is not supposed to work with economy or make clean castings. Most of the large pipe foundries employ chemists to analyze samples from each car load that they may be sure it is up to standard before it is allowed to be placed in the foundry. This keeps the facing man continually at work making his selection of coal of a quality that will stand the test and while coal coming from the same mine is supposed to stand the same analysis, there is nevertheless a considerable amount of difference in the different shipments that are made. The difficulty to contend with in making black wash for making pipe, is the liability of it foaming, having an appearance as though it contained a percentage of oil, as it refuses to mix with the clay water. Sometimes a barrel or bag that might be taken from a car load will be found to work in this way although the facing man has used his best endeavors to make it all regular. It is a peculiar thing that the same facing will work differently in the various shops although they may be using the same grades of moulding sand. Like the facing man there are certain secrets in the foundry, and while two foundrymen may use different material and make good work, each having his favorite facing. This reminds me of the different religions and their objects, all wanting to reach the blessed place in the other world through different channels. The Presbyterian, the Episcopalian and the Catholic all have their creeds and are making the endeavor to reach the coveted spot where foundries are not fashionable.

The greatest variety of fine facings are found in the foundries making machine castings and general work. Here we find facings with all kinds of names which leads to confusion. If one will look over the facing catalogue sent out by the different mills he will find no less than one hundred different brands, each of which are to accomplish the same results. It is this that makes it confusing to the foundrymen and the old saying, that there is nothing in a name holds true in fact. It is in these foundries that the greatest variety of work is made. Sometimes very hot iron is required while at others a slow iron can be used. For that reason a facing that might work excellently in the shop using slow iron might be inferior in the other using hot, as the hot iron is more searching and burns through the facing and sand. This is a very important matter and must be taken into consideration. It is necessary, as a rule, to use hot iron as it makes a clean, sharp corner, but foundrymen must bear in mind that a superior quality of both sand and facing should be selected to stand it.

Some years ago solid facings were used, that is, made from one material such as lead, charcoal, anthracite, mineral, etc., but of late years, in order to keep pace with the times, it has been found necessary to make mixtures of different materials of a refractory nature, which are adapted to the various kinds of castings made according to the size and shape. In other words, foundrymen cannot expect to use one facing to suit all classes of work. It is not an unusual thing to find a half dozen different brands in shops making machine and jobbing work.

I visited a foundry a short time since where they were using East India lead of a pure quality. The foreman reported that he was obliged to condemn it for the reason it washed and made scales on the castings. Upon investigating we found the moulder worked upon the principal, if a little was good, more was

better and he actually had, at least, one eighth of an inch thickness of the facing on the cope side of the mould. When I called his attention to it he directed the moulder to make another mould, using the same facing in a smaller quantity, being sure to have it well slicked and blown off with a bellows. After the two castings were poured, the one having too much facing on was ruined while the other was perfect. In this case, therefore, it was not the fault of the facing, but the moulder.

As an ending to this subject it will be well to remember that it is not always the facing that is at fault. It is sometimes the iron, sometimes the sand, sometimes the atmosphere that causes the trouble, but I believe after all the moulder who uses it has more to do with the successful working of the facing in making clean castings than any other element."

Asked by the chairman how far refractory materials like soapstone were used, Mr. Evans replied that all materials used in fine moulding were of a refractory nature. Lime was used very sparingly, as it was found to affect the eyes and the pores of the skin. It was used to a certain extent by some of the country founders, but they had to abandon it eventually. It was also used to a small extent as a mixture. Magnesia was not used to an extent greater than found in plumbago, coal or any mineral, and was not at all necessary. Asked how much ash there should be in a good facing, he stated that in facing for pipe work there should not be over 8 per cent., but 2 or 3 per cent was about the correct quantity. Coal for making facing was bought by analysis, and vast differences in the analysis of shipments were experienced, which occasioned much trouble. Eighty per cent. fixed carbon, 8 per cent. of ash, and the balance water, was the analysis usually expected.

The chairman, in speaking of pipe blackings, remarked that a peculiar circumstance noticeable in their preparation was that at times they absolutely refused to mix with the clay water or molasses, and when placed upon the mould the blacking would not adhere, and the iron picked it up and carried it along. He was told of a good plan for mixing it satisfactorily. In pipe shops it was a usual thing to have a cask of water mixed with the clay, and to dump a full bag, or large quantity of blacking into it, and endeavor to mix it. The mixture was occasionally, after a long time, effected; and sometimes was not effected at all. The surest and quickest plan was to make a paste with a small quantity of the blacking, and leads it up from that point to the consistency of cream, by adding more water and facing. In this way a nice black wash was to be secured.

Asked whether there was any extended use of gas-house carbon in the way of facing, Mr. Evans said that it made a very good wet black for bell moulds and pipe where the iron falls a long distance. It had more of a body to it than the anthracite. A number of foundries used it in the bell moulds. A trouble in connection with its use was that carbon, which had been bought at $6 or $7 per ton from the gas works, had advanced very much in price, owing to it being used largely by electric light plants for making their pencils. It was now about $12 per ton, with a probability of its going to $20 during the year. The electric light plants were trying to get it all. Petroleum carbon, the residue of the oil works, was also being used, and its price had gone up from $6 to $8.50 per ton.

E. E. Brown stated that his firm had discontinued the use of gas house carbon, as the supply was so very irregular. They had not yet decided what they should substitute for their high heats. A more vigorous blast was a thing to use very sparingly.

The discussion then turned on the subject of high heats, with a view to having some information on it forthcoming at the next meeting of the association.

Wm. Wark, of Dienelt & Eisenhardt, of Philadelphia, stated he would probably bring to the next meeting a sample of fine moulding, the equal of which he thought he could defy any moulder in Philadelphia to produce. It was made by a Frenchman in dry sand, and probably the members present would hardly

credit the fact of its being made in sand.

R. A. Register and Mr. McCarty, of the Pond Machine Tool Company also took part in the discussions.

Regarding the rumor that soil pipe was being freighted from Bessemer to Baltimore at rates only 5 per cent. advance on pig iron rates, Mr. Register stated that he had not been able to get freight bills in his possession, and that he had been informed that the railway would not answer any questions on the subject without production of a freight bill to substantiate the charges that such rates were being made.

The following new members were elected:

Waterbury Farrell Foundry and Machine Co., W. E. Fulton, Sec.-Treas.; Detroit Foundry Equipment Co., J. H. Whiting, Pres.

The meeting then adjourned.

CUPOLAS.

Their Construction and Management.

*A paper read before the National Association of Stove Manufacturers, Chicago, Ill., May 31st.

BY W. J. KEEP.

MANY years ago we measured every cupola of any importance in Troy and Albany, and in many other cities, and learned the shape of the lining when first put in. We procured a record of charges, blast, speed of melting, etc., and tabulated the results, expecting to discover some general correct principles of construction and management, but on the contrary found nothing to show that any shape or kind of management could not be equalled by others. A cupola with a foundry full of piece workers is not a profitable thing to experiment with. If you hear of a melter that can do better than your own, it is better to borrow him for a couple of weeks to remedy your defects, and you can then imitate his management. A few years ago the Michigan Stove Co. hired a melter from Mr. Smyser, to increase the rapidity of their melting, and we have retained the shapes for our cupola, which we adopted at that time.

We shall confine our remarks to cupolas from which the iron is caught by the men who use it, and who carry it away as fast as it is melted.

SIZE—Small foundries may need a cupola of small capacity, but if there is any chance of the business growing, it is better to have the outside diameter about six feet, and if necessary line it smaller for a few years.

A six foot cupola ought to deliver a constant stream without stopping during the heat, that will give a line of men all that they will want to do to take care of the iron. This would fill a 40 pound ladle every six seconds, and would melt from 10 to 11 tons per hour.

As it is difficult to guage the stream, it is more general to fill from 75 to 150 ladles in five seconds each, and then stop up for a couple of minutes. The rule should be to give the iron as fast as the men can take it away and return for another dip.

The most economical foundry, is one employing enough men to take about 16 tons of iron delivered from a six foot cupola, in from one and one-half to one and three-quarter hours.

SHAPE—This is not the same for coke as for coal. The tuyers for coal are often from 5 to 7 inches above the sand bottom, while for coke the distance should be from 14 to 18 inches. It is necessary, therefore, to determine the fuel before procuring a cupola. Equally good results are obtained with a cupola perfectly straight on the inside as with other shapes.

The rule in blast furnace construction, is to allow the lining to burn into any form that it chooses to take, and the next time to line the furnace with the same lines. This is a good rule if we wish to experiment with a cupola at all.

When the bottom is dropped it will be found that the melting point is within two feet of the tuyers, and that the lining has burned away considerably at that point. The slag will be built out above the tuyers by the chilling action of the blast. It is customary to chip away this slag and patch the sides. This does little good as the daubing melts off in a few moments after the blast is on.

If only the deepest holes are mended, and the slag is allowed to remain, and is daubed with fire clay, in a few days a bosh will form and the lining will cease to burn away.

If the result is an improvement, the same shape can be retained when the cupola is relined. There will be no trouble about having a clean drop. The melting point is held in the center so far away from the walls, that they are not heated nearly as much as with straight sides.

A four inch lining above the melting point will last a long time. This gives much more room for iron than a nine inch lining, and therefore hastens melting. The bosh is above the tuyers, and if you begin with a nine inch lining, and a straight cupola, and have let the cupola shape itself, you will have worked a bosh in six inches over and beyond the tuyers, and will have worked the lining above the bosh to four and a half inches thick. The inside diameter above the bosh will be 62 inches. The bosh at the narrowest point is 42 inches, and the diameter below the tuyers will be 56 inches. The sand bottom will be seven inches thick, from this to the tuyers will be about 18 inches. The tuyer opening will be 4 inches high. From the top of the tuyer for 12 inches the lining will slope inward, to the narrowest opening of the bosh. The lining will then gradually expand for 20 inches until a 4½ inch wall is reached.

The heat after leaving the melting point is absorbed by the fuel and iron above it, and the higher the charging door the better.

A charging door on each side is convenient, allowing fuel and scrap to be charged on one side, and iron and sprues on the other. The height of the stack will depend on the neighborhood. A high stack will carry the gases above the surrounding houses. It is difficult to construct a netting that will arrest sparks or that will last.

Below the tuyers, above the bosh, and above the charging doors, flanges should be rivited to the shell, so that any section of the lining can be removed at any time, without disturbing any other part.

Bricks costing from $12 to $20, last nearly as well as those costing twice as much, though they are not quite as large.

BLAST AND TUYERS—Probably the preference would be for a positive blast. It will start off at about 10 ounces, and as the cupola clogs up, will run up to 14 or 15 ounces. An increase of the blast above this will amount to the melting of about one ton additional per hour, for each ounce increased, though some have had a different experience.

The piping from the blower to the cupola should be large with very long curves if any are necessary. The large pipe, say 18 inches diameter, acts as a reservoir, and if long, two cupolas may be driven with one positive blower, which would be expected to drive only one. A large water guage should be attached to each cupola in such way that the figures can be seen 25 feet away. The one that we use has a reservoir under ground holding 3 gallons, and is made of 3 inch gas pipe with a copper float. It has required no attention for eight years. The wind should enter a bustle at three sides. The bustle should be large, and should extend all around the cupola, and should contain eight or ten large doors easily opened. The tuyers should be about 4 inches high and 7 inches wide, with at least 16 in a circle, and enough to make a continuous line would be better.

Two or more rows of small tuyers above this have found advocates, but after use for a short time they are generally abandoned, and as good results are obtained without them.

CHARGES—The bed of coke must be deep enough to hold the pig iron about a foot above the tuyers when it begins to melt. Enough fuel must be added at each charge to replenish the bed, and keep the iron at the melting point. There exists various opinions regarding the size of charges. Some use large charges with as good results as others using smaller ones. It would seem however that small charges of fuel at short intervals, would replenish the bed more uniformly, and only so much iron can be added as these additions of fuel will melt. In such a cupola as we have

described 1700 pounds of coke would be used for the bed. About 4000 pounds of iron would be put on, followed by 300 pounds of coke which will occupy about 5 inches in depth. This will melt at least 3000 pounds of iron which will occupy about 9 inches of depth. Towards the end as the cupola becomes hot, the coke charge may be decreased slightly. If a large number of charges are to be made, after the 16th the coke may be 275 pounds, and the last two charges may be 200 pounds.

RAPID MELTING—The smaller the amount of fuel used to keep the iron hot, the faster will be the melting, for if there be more fuel than is necessary to melt the iron, it must burn away before the next iron can get down to the melting point. If it is found that it is necessary to stop up often, it may be well to try and take 10 pounds of coke from each charge. If that hastens melting and the iron is still hot enough, after a few days, take off another 10 pounds, but go very cautiously with any change. The general practice is exactly the opposite. What ever happens the melter will add more coke, and thus make the melting still slowe.r Breaking the iron in pieces of about 25 pounds, causes the iron to melt faster, and uniform charging, so as not to allow the blast to work through faster at one point than at the other, is very important.

SLAGGING—If the heats are less than 16 tons, and especially if the sprues are milled, the slag that will accumulate will be needed to properly protect from the blast, the drops of iron as they pass down to the hearth. If the sprues are charged with the sand on, or if the heats are over 20 tons, a slag hole must be provided at little below the tuyers, and after about fifteen tons have been taken out, the slag should be tapped.

FLUXES—To make the slag fluid enough to run out of the slag hole, limestone or flour-spar must be added. The latter is expensive and to say the least gives no better results than limestone. Our experience has led us to consider limestone the best, irrespective of cost.

About 40 pounds to the ton of iron is sufficient. It should be broken a little smaller than an egg. The limestone should be taken from the outcrop or surface of the quarry, and will be white and brittle. That farther down is hard and dark colored and makes a thick black slag. When large heats are made, and the cupolas are slagged it is quite customary to charge sprues with the sand on them.

It is a question whether it is cheaper to melt the sand off or to mill the sprues. In large foundries making from 25 to 30 tons of sprues, it is quite a serious matter to mill them, and necessitates two extra handlings. It is then probably better to add lime, and flux away the sand.

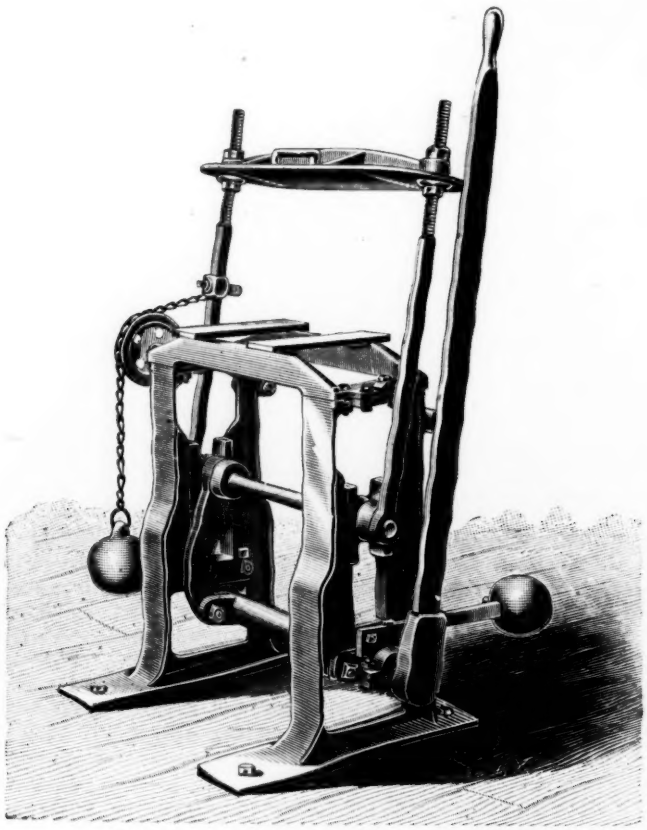
DULL IRON—In charging a cupola it is usual to add a few hundred pounds more iron than the molders call for. It is not well to run too close, as when the blast gets through the last charge the iron is likely to be dull. If unfortunately the iron runs short, scrap plate must be thrown in at the last end without fuel, and is almost sure to come out dull. If dull iron should occur in the middle of the heat, add a little more fuel to the charge that runs dull next day, though such dull iron generally results from a mistake in charging. It must result from a mistake in weighing the fuel or the iron, or from the iron hanging up, and later on, falling down below the melting point.

Inferior coke may cause dull iron but this a very unusual cause though the fuel invariably gets the blame.

QUALITY OF THE IRON—It is generally supposed that the best iron comes down at the first part of the heat, but the reverse is true. As the cupola gets hotter the quality of the iron improves, and any special work, such as patterns, should be poured near the last end, or when about two-thirds through. If a little white iron comes out at first, charge a hundred or two of silvery iron on the bed next day, which will correct the evil. By regulating the mixture properly, the first and last ladle are practically as good as any other ladle of iron for any work.

REYNOLDS PATENT MOLDING MACHINE.

THAT the molding machine is a success so far as it is used in connection with light or special bench work, no one will now deny. The fact that there are many foundries to-day running from 25 to 250 molding machines each is of itself sufficient evidence of that, but notwithstanding all this there yet remains on the part of some employers and employees a prejudice againt the more general adoption. Originally this antagonism showed itself more plainly in the case of the molder. This bitter



feeling has now, however, almost entirely passed away, the opposition and unreasonable prejudice of molders has given place to a desire to operate machines in preference to molding at the bench. This is particularly true in foundries where the employers have wisely allowed their molders to share in the benefits to be derived from the use of machines. The fact of its being an unqualified success has made all progressive superintendents and foundry foremen realize that not to understand machine molding is to be deficient in one of the most important branches of their trade.

The usual method and most convenient for operating machines is to make the flask about one inch deeper than for hand ramming, leaving the follow board small enough to press in the flask, thus using the extra one inch depth of the flask as a measure for the quantity of sand necessary to secure the requisite pressure. Molds made on a machine are necessarily pressed more evenly than is possible in molds tamped up with hand rammers, and patterns that are hard to cope when made with hand rammers can generally be readily made on the machine. The castings are more perfect and less likely to be scabbed, as the mold has not that serious defect often found in hand rammed work, of being hard in some spots and soft in others. In molding patterns of which there are hubs or projections, castings are often found which show what is

called a second formation—the sand has been rammed to the pattern and the impression taken, when by a series of tamps with the rammers the impression already made will be broken and a new one taken—resulting in the hubs or projections on the casting being out of shape and larger than the pattern. By using a molding machine this difficulty is overcome and much time saved, one pull of the lever driving the follow board into the flask, packing the sand evenly down on the patterns and doing what would require forty tamps with the hand rammers.

The machine we have illustrated is one of the simplest and best known of its class, made by Reynolds & Company, New Haven, Conn., one of the largest manufacturers of molding maching in the country and is only one of the many varieties made by them for different classes of work—and which are neatly illustrated in a good sized catalogue issued by them, containing a large amount of information on this subject.

STRONG IRON MIXTURES.

BY W. HOGUE.

THE question of strong iron mixtures is one frequently cropping up in many foundries, and thinking that perhaps a large number of your readers would be interested in the subject, I wish to submit an exact account of a couple of heats in a foundry where I worked, and which were used to make a peculiar shaped casting for a special purpose, but being patented and one of its main points of excellence the extreme hardness of the iron, I do not care to mention the exact purpose for which it was used. The outside of the casting was in the shape of a large, round shell and the inside was formed by a single core of the same shell, allowing 6" as a thickness of the metal. This shell was made in two parts (Drag and Cope) both of them being made of the best charcoal iron and finely finished inside. These two parts serving to form the outside of the shell, and acting as chills at the same time while the core forms the inside. The inside of the chill was cleaned thoroughly each time with oil. Before using them a coat of blacking made by mixing stale beer with the blackings to form a wash was put on evenly and dried by building a fire of wood and charcoal under each half of the shell. When perfectly dry the drag was turned over and the core set after, on this the cope was placed and bolted well all round, there being a hole about 15" square on the top of the flask or chill to admit the core, the metal being poured through this core running into the mold at the bottom.

The outer surface of the mold is well heated for about six hours before casting by building a fire all around it, care being taken that it does not chill too much before casting. The metal should not be poured too hot but kept in the ladle until it begins to check on top, to insure the best results.

Below are the exact figures of two charges and the way they were apportioned, as the castings run from 1000 to 5000 pounds, it can be seen that great care was required. All the iron used was Salsbury charcoal, and the various numbers given were different brands.

September 24th, 1892.

HEAT No. 1.

Charge.	Cake.	Coal.	Salsbury No. 3.	Iron 4½.	No. 5.	Cupola No. 6.	Previous Heat Scrap.	Total.
1st.	250	950	860	690	500	540	500	3090
2nd.	150	200	860	690	500	540	500	3090
3rd.	150	200	860	690	500	540	500	3090
4th.	150	200	860	690	500	540	500	3090
5th.	150	200	860	690	500	540	500	3090
6th.			860	690	500	540	500	3090
	850	1750	5160	4140	3000	3240	3000	18540
per c.	14.	14.	27.83	22.33	16.17	17.50	16.17	1.00

One Fuel, 7.13 Iron.

February 13th, 1893.

HEAT No. 2.

Charge.	Cake.	Coal.	Salsbury No. 3.	Iron 4.	No. 6.	Scrap.	Previous Heat Scrap.	Total.
1st.	350	900	600		600	1800		3000
2nd	200	150	600		600	1800		3000
3rd.	200	150	600		600	1800		3000
4th.	200	150	600		600	1800		3000
5th.	200	150	600		600	1800		3000
6th.	200	150	600		2400	2400		3000
7th.	175		500	500	200	600	600	2400
per c	15⅛	15½	20.	2.45	15.68	50.	.63	1.00

FROM OVER THE POND.

PERTH, WEST AUSTRALIA, March 20, '93.

MR. EDITOR—Having had the pleasure of perusing the different numbers of your neat publication, I thought that a few words from this far-off land might not be out of place, at present with a very limited population and trade. The Foundry industry on this side of the continent is just emerging from its shell by degrees, and a molder in these parts has to be acquainted with most all the points connected with the trade and to steer a smooth

course has to handle almost at any moment, dry or green sand or a loam job and often without the necessary rigging or time to make what is requisite to give him satisfaction or a satisfactory finish that most molders like to give to their work. The work here in most instances is the same as in your part of the world, jobbing or machinery work, agricultural, house and balcony work that is, columns, ornamental bronze and panels, balustrading, as it is a feature through Australia to finish a good class of residences or shops with cast iron work, which serves to ensure a degree of comfort in these dry and hot climates for six or seven months of the year. The stove industry in this part of the world will never become an important part of the great iron trade, as climatic conditions are against it, the demand being mostly for cooking purposes, and the heating and ventilation of business places and private residences as known in the states would not apply here or rather in Australia. The foregoing remarks will be understood to apply to West Australia, which is 1,300 miles from Adelaide, S. A. and where the foundry business is on a fairly large scale in machinery, agricultural, and pipe founding but which has been somewhat disjointed through labor disturbances that will be only of a temporary character, 570 odd miles East lies Melbourne, where almost any job in the iron line can be put through and where there are fully equipped shops for all classes of work required in a climate almost the reverse to yours. The steel trade also operates here in a degree in the shape of castings for tramways and engine work. 570 miles north the molder strikes Sydney, N. S. Wales the mother of Australasia, where the same remarks concerning the craft in Adelaide and Melbourne applies to this city, and where there are considerable docks for repair to the largest steamships that come to these waters, Sydney being the starting point of the San Francisco mail boats, whose journey occupies 622 days and covering some 7,000 miles each trip, about an equal distance by water or rail one reaches Brisbane, the Capitol of Queensland, where the climate is much the same as Perth, West Australia, known here as Banana Land in consequence of the tropical nature of its produce and sugar in the northern areas. There is considerable iron used in this colony in mining, alluvial and quartz and also in the cane crushing mills in use on the plantation. There are other large tracts of country Tasmania, and New Zealand, which I may say a few words in reference too on some future occasion. In closing I may add that the molder wherever he may go, will find much the same to encounter in the trade he has selected to obtain a livelihood.

I remain yours,

WM. GOLDSWORTHY,
Foreman W. A. Foundry Co.

NEW FOUNDRY ENTERPRISES.

The North-western Wheel Co. are about to erect a new foundry 80x80 in St. Paul, Minn.

Frank Butcher is about to start a foundry at Heraldsburg, Cal.

Chas. Duisdecker is building a new foundry 75x95 feet in Pekin, Ill.

E. Horton & Son, Windsor Locks, Conn., are about to enlarge their foundry.

David Higgings has succeeded C. H. Gove & Co. in the foundry business at Norwalk, Ohio.

The Menzel Foundry Co. has been organized at Minneapolis, Minn. Capital, $50,000.00.

Dyer W. Williams and C. B. Williams have organized the Williams Foundry & Machine Co. at Cedar Rapids, Ia. Capital, $25,000.00.

The Moore Mfg. & Fdy. Co. are removing from Milwaukee to South Milwaukee in order to double its capacity.

The Lloyd-Brook Co's new founday in Youngstown, O., will be 130x60 with two sheds 80x20.

Superior, Wis., is to have a large brass foundry which has just been induced by the Land & Improvement Co. to remove there from St. Paul and which employs 100 men.

The Craig-Reynolds new foundries at No. Dayton, O., about completed, are quite extensive, one being 75x200, another 60x200, another 40x60 and two 50x70 each, besides cupola room, engine room, etc., cost $35,000.00.

The M. Steele Co., Springfield, O., have sold the part of their business pertaining to the manufacture of the Blakeney Cupola Furnace to the Springfield Cupola Co., and the manufacture and sale of said cupola will be continued by the latter.

The many friends of Mr. R. E. Masters, Mangr. of the Marshall Car Wheel and Foundry Co. Marshall, Texas, will be interested to know that the Company is in such a prosperous condition that they propose to erect a large plant for the manufacture of car wheels

at Houston Heights, Texas, which will be operated in connection with their present works. The wheels made by this company have attained an enviable reputation among southern railroads, and Mr. Masters is to be congratulated on the success which has evidently crowned his efforts thus far.

The Garden City Sand Co., Chicago, Ill., have been compelled by pressure of business to remove to larger and more commodious quarters, being now located at 1010 Security Building. This firm is achieving quite a reputation for handling a large and varied stock of molding sand, fire brick, clay, foundry supplies, etc.

Kearney, Neb., is to have a foundry 32x50.

McMartin & Sons, Dayton, O., intend to remove their plant to Sidney, in same state. The Board of Improvement in the latter place are donating free site, foundry 104x95, 2-story warehouse 100x60, engine and boiler house, pattern sheds, core oven, etc., besides contributing $1,000.00 towards cost of removal.

After investigating the heating and ventilating systems of a number of the foremost and largest churches in America, it has been decided to award the Buffalo Forge Co., Buffalo, N. Y., contracts for the heating and ventilating plants for the new Christ M. E. Church, Pittsburgh, Pa., and the Calvery M. E. Church, Allegheny, Pa. By far these two churches are the largest edifices in either of these enterprising cities. The estimated cost of each of the buildings is three hundred thousand dollars. The heating apparatus consists of, in each instance 12 foot Fans, and Heaters containing 6000-ft of pipe.

In every example of Church heating and ventilating installed by this Company, the apparatus is so built that it can be used as a cooling machine in summer, as well as a heating and ventilating plant combined during the cold weather. Arrangement is further provided that during the moderate weather, hot air and cold air can be mixed, and thus the ventilation is kept up without overheating the audience room. The machinery and materials employed in the heating and ventilating plant for the above buildings, constitute more than two carloads.

AMONG THE MAGAZINES.

The Russian marshal Suvaroff was famous as a jester, and was fond of confusing the men under his command by asking them unexpected and absurd questions. But occasionally he met his match. Thus, one bitter January night, such as Russia only can produce, he rode up to a sentry and demanded,—

"How many stars are there in the sky?"

The soldier, not a whit disturbed, answered coolly,—

"Wait a little and I'll tell you." And he deliberately commenced counting, "One, two, three," etc.

When he had reached one hundred, Suvaroff, who was half frozen, thought it was high time to ride off, not, however, without inquiring the name of the ready reckoner. Next day the latter found himself promoted.—*W. S. Walsh, in June* LIPPINCOTT'S.

The German Empress is not a brilliant woman, nor does she care much for popular applause, writes Arthur Warren, in a pleasant sketch under the title of "An Empress at Home" in the June *Ladies' Home Journal*. Germany, therefore, is fortunate. It is quite sufficient that Wilhelm II should be the most dashing, masterful, restless figure on the stage of European affairs. Augusta Victoria has no desire to "play up" to such a 'lead." She does not aspire to captivate the general gaze, nor does she claim to be divinely inspired. She is not ambitious. No war will be precipitated by her caprice, no statesmen made and unmade by her smiles and frowns; for policies of State she has as little inclination as her husband has for monastic seclusion.

What, then, have been the chief factors in producing that disturbed condition of the money market, that loss of business confidence, and that sharp collapse of credit, which filled the news record of May with a long list of business failures and suspensions, and which has inflicted a sort of paralysis upon the commercial and industrial life of the country?

The Silver Politicians Chiefly to Blame:

First and foremost, in our opinion, this state of affairs must be laid at the door of our politicians. Their failure to settle the silver question in one way or another is of itself sufficient to account for much of that oversensitiveness of the money market which has checked the flow of credit just at the moment when it was most desirable that credit should flow freely in order to avert disaster. If the last Congress had repealed the present silver law, practically all of our recent business troubles would have been avoided. Our present mone-

tary laws and their working, far from being of any advantage to the silver men or of any value for the future realization of bimetallism, either American or international, are of the most serious detriment to the silver cause.—*From the "Progress of the World," June Review of Reviews.*

The cowbird, like the European cuckoo, never pairs, builds a nest, or hatches its own young. The flocks that frequent cow-pastures are composed of males and females that consort together promiscuously, and the female, when the time comes, leaves her companions and sets out alone to find the nest of some small bird in which she lays the egg, and then leaves it entirely to the care of the unwilling, and often unwitting, foster-parents. As a rule, this means the destruction of the bird's own brood, for the the young cowbird, being hatched sooner than the true offspring, monopolizes all attentions, and the other young, if hatched, at all, die of unavoidable neglect.—From The Birds That we See," by Ernest E. Thompson, in the June *Scribner.*

A subject of great and growing importance, that of irrigation in the Arid States, has the first place in The Popular Science Monthly for June. The article is by Charles Howard Shinn, who describes practical methods and their results, illustrating both with handsome cuts. Herbert Spencer concludes in this number his essay on The Inadequacy of "Natural Selection," which has attracted much attention from thoughtful evolutionists. The ceremonial Use of Tobacco, comprising the use of tobacco as incense and sacrifice and in the operations of seers and medicine-men, is described by John Hawkins. An Ethnological Study of the Yuruks, a wandering people of Turkey, is contributed by Alcide T. M. d'Andria. The features, dress, and dwellings of this people are shown in illustrations. Under the title Modern Miracles, Prof. E. P. Evans describes some of the astonishing feats of Arabian and Hindu fakirs. An article describing The Phenomena of Death in Battle is contributed by George L. Kilmer. In The Revival of Witchcraft, some of the later developments of hypnotism are shown to be based on fraud and delusion. The article is by Dr. Ernest Hart, who has examined most of the famous hypnotic subjects in Paris. Certain Adaptations of Seeds and Fruits, which serve to utilize favorable and resist unfavorble influences, are described by J. W. Folsom. In Why Grow Old? some hints toward preserving early vigor are given. James Macdonald's interesting account of East Central African Customs is included in this number. Frank H. Eaton describes The Bay of Fundy Tides and Marshes. Sir Archibald Geikie is the subject of the usual Sketch and Portrait.

Francis E. Abbott contributes to the June *New England Magazine* an article, fully illustrated, dealing with "The Boston Tea Party" and the men and events of that time.

Outing for June opens with an excellent article on black-bass fishing, by Francis J. Hogan. Other prominent features of a finely illustrated and interesting number are—"After Kangaroo," by Edward Wakefield; "The Sailing Yacht of To-day," by Chas. L. Norton; "Kings of the Trotting Track," by "Dexter;" "Shore Birds and Shore-bird Shooting," by Ed W. Sandys; and the continuation of "Through Erin Awheel, by Grace E. Denison.

THE WESTERN FOUNDRYMEN'S ASSOCIATION.

THURSDAY, May 25th, was a red letter day for Western Foundrymen, as on that date there assembled in Chicago a large number of gentlemen connected with or interested in the foundry business, for the purpose of founding an association whose object would be the promotion of the interests of all conuected with the great industry in America and especially in that territory known as the Western States or the states west of, and including Michigan, Ohio, etc.

Among those present were:

C. A. Sercombe, of Schawb & Sercombe, Milwaukee, Wis.; S. H. Holly, Lake Shore Foundry Co., Marquette, Mich., J. Bowie, Walburn, Swenson & Co., Chicago, Ill.; Wm. Hardee, Shaw, Kendall & Co., Toledo, O.; J. L. Gobeille, Gobeille Pattern Co., Cleveland, Ohio.; C. M. Conradson, Fuller & Johnson Mfg. Co., Madison, Wis.; J. E. Griffen, S. Milwaukee Mall. Iron Co., Milwaukee, Wis.; J. A Penton, THE FOUNDRY, Detroit, Mich.; James Frake, Chicago, Ill.; John M. Sweeney, General Engineering Co., Harvey, Ill.; A.

I. Findley, *Iron Trade Review,* Cleveland, Ohio.; A. L. Patch, Patch & Swift, Streater, Ill,; H. W. Hurlburt, Hurlburt Mfg. Co., Racine Junction, Wis.; C. A. Plamondon, A. Plamondon Mfg. Co., Chicago, Ill.; Theo. P. Byram, Byram & Co., Detroit, Mich.; Chas. S. Reed, Sec'y, Chicago. H. S. Vrooman, Garden city Sand Co.; A. T. Whiting, and J. H. Whiting, Detroit Fdy. Equipment Co., Detroit, Mich.; Geo. W. Cope, Asso. Editor *Iron Age,* Chicago; W. D. Sargent, Sargent Company, Chicago; B. M. Gardiner, *Iron Trade Review,* Chicago.

At 10:30 a. m., Mr. A. Findley of the *Iron Trade Review,* called the meeting to order and asked for nomination of temporary chairman. Mr. John A. Penton, of THE FOUNDRY, proposed Mr. C. Sercombe of Milwaukee, and he having been elected unanimously, accepted the position, saying that while flattered at the compliment bestowed upon him he would do his best to fill it creditably, and called for nominations for the position of Secretary.

Mr. A. I. Findley proposed Mr. A. T. Whiting, who was elected and accepted.

Mr. Sercombe said he had some correspondence with various parties with reference to this Association, besides speaking to others and all regarded the idea favorably ; he thought it would be a good plan to have a general expression of opinion on the subject and called upon M. Findlay. The latter gentleman said he had not intended to say anything, but brought with him some letters and expressions of opinion from Western Foundrymen upon the advisability of organizing an association in the West like that in the East, and to which a number of Western Foundrymen belong. Letters were then read from the following: Mr. F. Schumann of the Tacony Iron & Metal, Co., Philadelphia, P.; Mr. Thos. D. West, T. D. West Fdy. Co., Sharpsville, Pa.; Mr. J. C. Fortner, Indiana Car & Fdy. Co., Indianapolis, Ind.; Mr. R. C McKinney, Sec'y and Treas. Niles Tool Wks. Hamilton, O.; S. E. Hilles, Samuel C. Tatum Co., Cincinnati, Ohio; Sandusky Mach. & Agr'l Wks. Sandusky, Ohio; John T Noye Mfg. Co., Buffalo, N. Y.; The Lane & Bodley Co.. Cincinnatti, O.; Racine Hardware Mfg. Co., Dayton, O.; Craig-Reynolds Fdy. C., Dayton, O.; Murphy Foundry Co., Alliance, O.; Vierling McDowell Co., Chicago, Ill.; W. J. Keep, Detroit, Mich.; after which Mr. Findlay read from the constitution of the Philadelphia Association, the object for which it had been formed and suggested that an enrollment be taken of those present. The chairman suggested that the Secretary should make out such a list, and Mr. Sweeney thought it might be a good plan to keep a book in which all those present should register at each meeting, as that plan was successfully followed in similar societies to which he belonged.

The chair having invited those present to express their opinion, an interesting discussion took place, in which several of those present took part. Mr. Hardee came to listen and learn. Mr. Plamondon spoke of the work they had been doing in Chicago towards forming a local association. With them the question of wages had been paramount to everthing else, and while business was very dull, many of the foundries were compelled to pay their men a minimum of $2.75 per day, he was in favor of a permanent organization, however, and believed he knew of at least twenty-five firms in Chicago who were likewise. Mr. Findlay said he believed that handling the price question had been thought of but abandoned by the Philadelphia Association, the question of wages never being discussed in their meetings. He referred to the Association in Cleveland and elesewhere who had, but thought we should have a different basis to that in the East. Mr. Conradson while giving due importance to the wages question, thought other important matters should not be neglected, then again the wages question was more or less a local one, while this organization was general in character having many members in different places.

There were he thought matters of greater importance to be considered, he bought many castings in Chicago, and knew one firm alone that he believed

had lost $5,000.00 through their inability to make good work, and if this organization could be the means of showing this firm how to make better castings, they could afford any reasonable wages. It should be our policy to educate our foundrymen and molders to make better work, and he would later on suggest that a committee be formed to report on the advisability of establishing a laboratory in charge of an expert chemist, with a view of securing all the information possible for the members of this Association on the subject of iron and foundry supplies, such information to be given out monthly or quarterly in circular form to the members.

Mr. Sweeney depreciated the idea of making the wages subject too prominent. The foundry business required more chemical and expert knowledge than it gets, and in his opinion no industry required a greater amount of brains to make it thoroughly successful than the foundry business.

Mr. Penton had been a close student of the Philadelphia Association and had noted the good accomplished, which can be easily seen by the number of prominent and busy men it gets together and whose interest it retains. Similar organizations have been organized in Pittsburgh, Cleveland, Washington, D. C. Chattanooga, etc. This Association should be founded on a broad and liberal basis and the wages matter left where it belongs, viz: under the control of those localities where it requires attention.

There was too much competition among foundrymen, and this Association by bringing them together might create a much more friendly feeling among those whose interests were identical. Papers read by practical men on practical subjects would teach us all much, and by bringing the best ideas of the brightest minds in the foundry business much waste of money might be saved; he moved that we do now proceed to form a permanent organization. Carried.

Mr. Sweeney moved the appointment of a committee on Constitution and By-Laws. Carried. The chair appointed Messrs. Sweeney, Penton, Conradson, and Findlay. While the committee was preparing its raport, the discussions were continued, Mr. Gobeille thinking the wages matter as important as any. In his opinion the two important things to the foundrymen were the price he got for his castings and the wages he had to pay. Iron and everything else is cheap enough—except labor. He said the price of castings was improving in the East. He knew of one large contract where they had improved three-eights of a cent, and another one-fourth of a cent, and, owing to his position he could learn the truth better than an outsider. Mr. Vrooman suggested the advisability of having a committee to look after subjects to receive the attention of the association when it met.

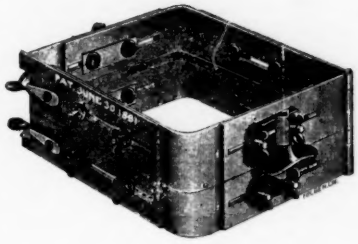
The following resolution was then adopted:

RESOLVED—That all firms, corporations, or persons who have agreed to attend this meeting,or who have attended or expressed approval of this organization shall be entered by the Secretary as members. The committee on Constitution and By-Laws then made their report, which after some discussion was adopted. The chair on the motion of Mr. Sargent, appointed a nominating committee consisting of Messrs. Sargent, Patch and Conradson, who brought in the following list of officers who were unanimously confirmed:

President, C. A. Plamondon; Vice-President, J. M. Sweeney; Secretary, B. M. Gardiner; Treasurer, A. L. Patch; Executive Committee—S. H. Holly, Geo. W. Cope, J. E. Griffen, J. A. Penton, C. A. Sercombe.

A vote of thanks was tendered Mr. J. H. Whiting, Pres. of the Detroit Foundry Equipment Co., for the use of his rooms, and the Association adjourned until the third Wednesday in June, when it will again meet in the rooms of the Detroit Foundry Equipment Co., 703 Temple Place, Chicago, Ill.

The Malleable Iron Co., Dayton, O., is erecting an addition.



J. H. WILSON. ALBERT BERTCH. M. F. RICHARDSON.

—OFFICE OF—

THE ADJUSTABLE SNAP FLASK CO.,

Manufacturers and Owners of

Richardson's Patent Adjustable Snap Flask.

PATENTED JUNE 30TH, 1891.

Elkhart, Ind., March 1st 1893

The Foundry Publishing Co.
Detroit, Mich

Gentlemen:—

Replying to your favor of recent date will say, that as an advertising medium we consider your journal very valuable. As this is the only medium, up to date, through which we have advertised, we can trace our entire success to The Foundry.

Wishing you success. We remain;

Yours Very Truly.

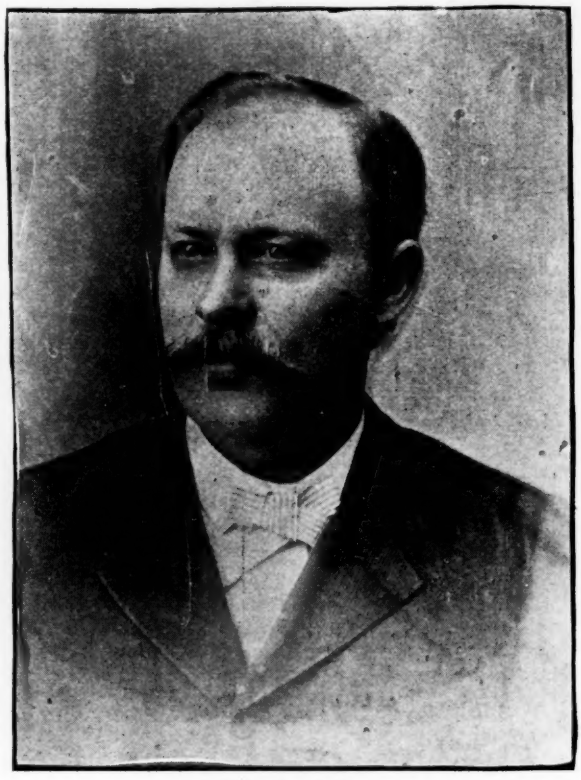
THE ADJUSTABLE SNAP FLASK CO.
Per Albert Bertch Secy

The Adjustable Snap Flask Co. is, comparatively speaking, a new concern, they only having commenced business January 1st, 1893, and wisely decided as a preliminary move to place an ad in THE FOUNDRY. That it was a wise one on their part and that they are amply satisfied is demonstrated by the above reproduction of a letter written by them to this office. It is only one of many received and there are others to follow.

MR. JULIUS SMITH.

IT gives us great pleasure to present to our readers this month, a portrait of one of the best known and most popular foundry foremen in the West, Mr. Julius Smith of St. Louis, Mo.

If mechanical ability, strict integrity, and a genial disposition, coupled with a desire to be just towards all, should win friends, then it can be easily understood why the popular foreman of the Fluton Foundry in St. Louis, Mo. has so many who never tire of singing his praises.



JULIUS SMITH.

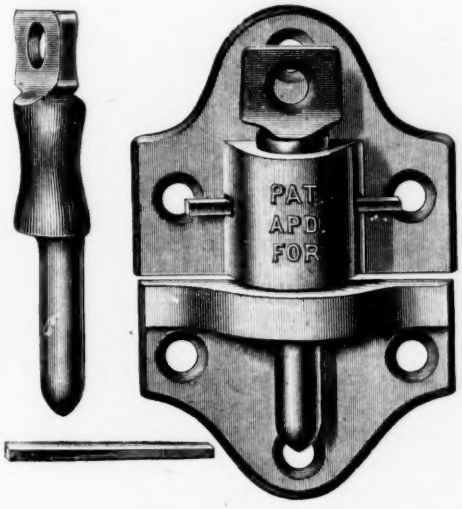
Mr. Smith was born in Germany in 1849, moving with his parents to this country two years later and settling in St. Louis, Mo. In 1864, when but fifteen years old he commenced to learn the molder's trade in G. P. Allen's foundry, one of the oldest and best shops in St. Louis and with one or two exceptions he has remained with that firm ever since. In 1884 his superior ability, together with other commendable qualities was recognized by the firm in their tendering him the foremanship of the foundry which he accepted and has filled ever since.

As the work turned out of this foundry covers a wide range, being principally heavy machinery, it requires the constant thought and devotion of a master mechanic and the success attending Mr. Smith's efforts, has brought him an enviable reputation that many, even among prominent foundrymen might be proud of.

PATENTED ADJUSTABLE FLASK PIN.

THE cut represents a devise needed in every foundry. Flasks subjected to the elements, warps more or less, and necessitates the resetting of pins if shifting is to be prevented. This requires the aid of a carpenter or pattern maker.

This is obviated in this patent, the molder draws the key, and in a second makes a perfect adjustment, and replace the key without having had to



awaits for the assistance of anyone, and thereby economizing in his and his assistant's time.

On heavy work where one or more checks are used, the pin can be drawn before shaking out, thereby saving pins from breaking, and the twisting of plates.

Made in three sizes, and for sale by J. W. Paxson & Co., Phila, Pa.

THE DETROIT STOVE WORKS TALLY-HO.

A MAN or woman who visits the World's Fair, and besides seeing the main attractions, manages to take a trip in the large Ferris Wheel and go up in the captive baloon, can consider himself or herself lucky, but if in addition they should succed in securing an invitation to take a ride from Chicago to the grounds in the beautiful Tally-Ho coach that has been placed at the service of its friends and patrons by the Detroit Stove Works, their cup of pleasure should be complete,

ATTENTION!

FOUNDRYMEN who may be in the market for anything in the foundry business should immediately notify this office and we will take pleasure in placing them in immediate communication with the leading responsible dealers in the various lines of foundry merchandise. If you need an iron building, scaffold, cupola, ladles, blowers, sand mixer, molding sand, molding machine, crane, snap flask, tumbling barrel, crucible, chaplets, wheelbarrow or patterns, it will be money in your pocket to let us know.

PERSONAL MENTION.

Alba Rossman, a resident of Allegan, Wis., for many years and who established the foundry there in 1830, died there early last month.

Mr. R. Walsh has secured the plant of Pritchard & Andrews, Ottawa, Canada, and is now doing brass work in all its branches.

Mr. Wm. H. Connor, Supt. of the foundry of McIntosh, Hemphill & Co. for 25 years, was presented by those under him with a handsome gold-headed cane, gold watch and chain set with diamonds upon the occasion of his leaving there recently to accept a position with Carnegie Bros. & Co., and take charge of their Foundry at Bessemer.

THE FOUNDRY is the best journal I ever read, and I would not be without it.

M. HUGHES,
Phoenix, Arizona.

A MOLDING MACHINE AT THE FAIR.

WE are requested to inform our readers that a Tabor Molding Machine can be seen in operation in the machine shop of Manning, Maxwell & Moore, Annex Machinery Hall, World's Columbian Exposition, Chicago. All interested in this subject who visit Chicago should see it.

BOOKS, EXCHANGES, CATALOGUES, ETC.

Thomas Carlin & Sons, Iron Founders, Allegheny City, Pa., send us a neat 16-page catalogue of their City Park and Sewer Castings, illustrating the large line of sewer castings, gutter crossings, etc., manufactured by them. Anyone interested in this subject ought to send for it.

The American Artisan Pocket Reference Book for tinsmiths and sheet metal workers has been received, and we judge from its contents that to those engaged in that business, it would prove a most interesting and valuable guide. It can be had of the American Artisan Publishing Co., Chicago, Ill.

The J. D. Smith Foundry Supply Company, Cincinnati, O., have issued what they call a Supplementary Catalogue, No. 16, devoted exclusively to molders' tools, etc. It is nicely illustrated and covers the whole subject from trowel to swab.

The Gobeille Pattern Co., are sending to their customers and the foundry trade generally, a very diminutive envelope containing a neat card with their "Be Wise Owl" in one corner, and a two-cent Columbian stamp containing printed on the back the information in a few pithy and well chosen words that they have the largest works in the world, etc., and if interested in the subject of patterns, "Use this stamp."

We take especial pleasure in acknowledging the receipt, with the author's compliments, of a neatly printed volume of 150 pages containing an extensive and thoroughly scientific review of the subject and subjects connected with "Alloys of Iron and Chromium" and contains all one would expect to see referred to in a work of that magnitude by such a well-known searcher after new truths, as R. A. Hadfield, of Hadfield's Steel Foundry Co., Sheffield, England. A careful perusal of the contents of such a work is a whole education in itself, and we thank him again for remembering us.

THE FIRE FIEND.

Z. T. Graham's foundry at Worthington, Ind., was destroyed by fire May 12. Loss, $200.00.

The pattern room attached to the Bedford foundry, Indianapolis, Ind., was burned May 23d. Loss, $1,000.00.

Arthur Worth's foundry at St. Helena, Cal., was destroyed by fire May 18th. Loss, $6,000.00, Insurance, $2,700.00.

Cornell's foundry, New York, has been totally demolished by fire. As it consisted of a number of frame structures principally, it burned without much trouble. Loss said to be $300,000.00.

FOUNDING AND MATALLURGY.

As Practiced in the Early Part of the Last Century.

Continued from April.

Translated from Reaumur for THE FOUNDRY by N. DANTERVILLE.

I SOMETIMES added one-eighth part of lime to my usual mixtures, and in such small quantities it did no harm, but even produced a good effect in the reducing of certain flaws of which we shall speak later, that sometimes appear on the surface of the iron, ordinary plaster used in the proportion of one-twelfth part being still more efficient for that purpose.

Pounded glass I found of no other use than to diminish these flaws in extent and number, and it acts no better than lime or plaster, besides being more difficult to gather and pulverize, while the good it does is so slight that it is of little avail, and in large establishments it becomes necessary to employ only those materials easily obtainable and utilized.

The same book to which we have just referred gives on page 31 another mixture, one of whose ingredients it would be difficult to obtain for work on a large scale: it consists of 12 parts of beech charcoal, 10 parts of horn, 3 parts ashes of new wood, three parts of powder of pomegranate bark. (Where would

manufacturers supply themselves with pomegranate bark, which is here I think more injurious than useful?) But to return to the two compositions to which we believe we should give the preference, they only require, fortunately, things easily obtainable and which, except the sea salt, are equally as cheap. Further, the preparations they need, do not entail great expense, the soot only required to be passed through a large sieve, if in fine particles all the better, but it is not necessary to burn it, as I found out after using it both burnt and unburnt, as for the ashes notwithstanding all that had been said about the choice that should be made, I think that to have them from new wood is all that is necessary, and have them passed through a sieve moderately fine, the charcoal could be reduced to a powder and passed through a similar sieve. All charcoal can be used, though that from oak is a little more active, and that from whitewood and beech nearly as good, although the difference is so small that it is hard to be determined in the most exact experiments and of little importance in practice. The sea salt should be reduced to a fine powder, and to pulverize it more conveniently it should be placed in a creuset that is heated red hot and lastly, the different quantities should be mixed with all the exactitude possible.

When one wishes to work on a large scale these things can all be done to better advantage, by especial contrivances made for that purposes, and perhaps done better than when done by hand, and and it can be easily shown when a mixture is thoroughly done, when it shows a uniform color all over.

To mix the salt more thoroughly, in some cases I dissolved it in water, and then sprinkled the other materials already mixed, but found that the method did more harm than good and besides having to wait until the composition should dry I found that it was rendered less active, the salt perhaps being more easily carried away.

As the materials which enter into these compositions should be in certain proportions, so should a certain quantity be used for a certain quantity of iron. If we are too extravagant with the mixture, the steel may be spoiled; too much of it is apt to crack the steel and too little has not the necessary force to render it effective. There is however, ample latitude in this to prevent mistakes, and the differences in the creusets themselves and the furnaces wherein they are heated have an important effect, and require more or less of the matter as the case may be. However, if we use in general 2 ounces and 3 drams of composition to one pound of iron, that is to say, one ounce of soot, half ounce of ashes, half ounce of charcoal and at most 3 drams of salt, we will get the best results.

If the iron which is to be converted into steel of most excellent quality this allowance may be augmented, the operation being performed all the more quickly and the steel also gain in quality, but on the contrary, if the iron is not suitable to become good steel, the surer way will be to decrease the preceding quantity. As for the price of the materials entering into the mixture, they are not worthy of consideration in comparison with the increased value of steel over iron. As for the other expenses we will treat of them later on and explain how this composition is arranged, layer by layer, with the iron, but add here that when the steel is withdrawn from the furnace the composition ought not to be regarded as useless; it is diminished in weight and volume, but what is left is in a good state to act on new iron and can be mixed fearlessly with new composition without materially weakening it, provided we observe some precautions we shall not hesitate to mention elsewhere.

The following letter is self-explanatory, and refers to a small item in our May issue:

CLEVELAND, May 25th, 1893.

MR. EDITOR—Please correct statement that either myself or The Gobeille Pattern Company are "back of" the new foundry at Chagrin Falls. The only interest my company has is in a contract for castings for iron patterns for stoves and other light ornamental work.

We are in the pattern business exclusively.

Respectfully,
JOS. LEON GOBEILLE.

NEW YORK AND VICINITY.

Recent inquiries made in New York, and Brooklyn, by a representative of THE FOUNDRY has developed the fact that the "Founders Core Compound" (for cores that are baked in plates) has qualities that will soon place it upon the catalogue of useful articles in a foundry, it is manufactured by W. H. Stewart, New York City.

The Henry Huber Company, (manufacturers of sanitary specialties) on or about May 1st, leased the foundry connected with their factory at 461-487 E. 136 St., N. Y. to Mr. Chas. Creighton & Son, who have converted it into a regular jobbing foundry, making fine iron castings of all kinds, a specialty Mr. Creighton has had about fifteen years' experience as foreman for T. Shriver & Son, Iron and Brass Founders in N. Y. and should have a thorough knowledge of the business he has undertaken.

A noticeable feature among the recent improvements at the Fulton Foundry & Machine Works, 21 Furman St., Brooklyn, N. Y., is several large well-constructed closets for the use of the molders. The works are ruuning to their full capacity, making fine iron castings for all kinds of machinery, tool and pattern making, general machinists, die press and interchangeable work, plain and ornamental japanning, sewing machine needles.

THEY COME TOGETHER.

WEDNESDAY, May 31st, was the day set for the meeting in Chicago of the National Association of Stove Manufacturers, and at a meeting held there at that time and which we see commented on in various ways in the trade papers of the country, was discussed the question of the raise of wages asked for by the Iron Molders' Union of North America. The matter had been long before the Association one way or another for some time, having been finally referred to this meeting.

The Union was represented by Martin Fox, President, of Cincinnati, Ohio, P. Enwright of Chicago, John Campbell of Quincy, Ill.; Martin Monahan of Albany, N. Y., and J. G. Galloway of Dayton, Ohio, all of whom were introduced to the convention in turn and addressed it advocating the increase requested, being replied to by Henry Cribben, of Chicago, A. Brentrano, Evansville, Ind., A. C. Hamilton, Bloomington, Ill., F. W. Gardner, Chicago, Grange Sard, Albany, N. Y. This meeting and the fact that some of the officials and prominent members of the Union met together with the representatives of the National Stove Manufacturers' Association mark a new era we should think, in the history of the history of the Iron Molders' Union, and it is as it should be. It has never before happened in the history of the foundry business of this country, that so many eminent men have been gathered together, representing both sides of the all important question, as were assembled in Chicago, at that time, and THE FOUNDRY wishes to congratulate everyone interested upon the expression of good feeling that seemed to abound on either hand. The representatives of the Union were listened to with great courtesy, and many were the expressions of a complimentary nature concerning the ability evidenced by them in the eloquent addresses they delivered before the association. Owing to the condition of trade, however, and financial strain upon the country nothing was accomplished, but THE FOUNDRY sees in this meeting together, much that is hopeful for the molders and their representatives, and if they but continue to cultivate the good feeling of their employers in the manner that has evidently actuated them of late we think the meeting in Chicago, though barren of immediate results, will bear fruit in the future.

Speaking of the subject, "Metal," a representative trade paper has this to say concerning a couple of the gentlemen present: "Martin Fox, President of the Iron Molders' Union of North

America, impressed the stove manufacturers generally as being a very able man and one who is entirely competent to manage the trust placed in his hands in a way to make the most of it for molders in general.

With all, the general verdict was, that he was eminently fair-minded, and a man who would rely upon the justness of his cause for success rather than resort to the demagogic measures which sometimes characterize labor leaders."

"J. G. Galloway, one of the representatives of the Molders' Union who addressed the stove manufacturers, resides at Dayton, Ohio.

Mr. Galloway has long been engaged in his trade and was a mechanic of acknowledged skill, as the writer can testify, some twenty-five years ago. In his speech he demonstrated that he had carefully studied certain schools of political economy and that he has the question of capital and labor at his tongue's end, in a way to present the labor side of the case in a most able and comprehensive manner. He is apt at repartee and an able debater."

QUESTIONS AND ANSWERS.

A subscriber wants to know who manufactures iron molds for making ornamental lawn furniture, iron vases, etc.

Q. & C. desire to know who makes a machine and other appliances for molding, and the economical manufacture of sash-weights.

John Pettigrew, Jr., well-known in Joliet, Ill., and the surrounding country, has taken a lease of the Pitts Foundry in that city and has commenced business for himself. He proposes to do a general line of jobbing work, and is prepared to guarantee the quality of every casting that he turns out.

NOTICE.

All advertisements under this head given two insertions free of charge when placed therein by subscribers. All others will be charged 2 cents per word for each insertion.

AN ENERGETIC EXPERIENCED IRON MOLDER who fully understands the charge of men, wishes a position as foreman. Address Energetic, this office.

IF THE PARTIES, who advertised in April number of "The Foundry" under title of "Change" and "W. P. B.," will communicate with this office they will receive some replies.

WANTED—Five good, sober heavy machine molders—steady work. Stevenson & Co. Wellsville, O.

A MOLDER with 15 years experience, capable of running a shop, wishes to take an active interest in some machine foundry. References exchanged. Address M. M. care "The Foundry."

AN EXPERIENCED and energetic iron molder who understands something about steel molding, fully capable of taking charge of a foundry, would like a position. Can furnish the best of references. Address J. B. W., this office.

TRAVELING salesman, energetic and reliable men, who reach the foundry trade, to push as a side line, a first-class article. Exclusive territory and liberal commissions given. In replying please state territory you cover and goods you handle. Address, G. H. Gardner, 31 Vincent St. Cleveland, O.

Advertisements inserted under this head for 25 cents a line each insertion.

WANTED—Second hand Baker Blower of the highest pressure. Must be in first-class condition and cheap. Pingley & Co., Box 117, Birmingham Ala.

WANTED—A man to take charge of a new and very modern foundry—all green sand work. Six floor men and fourteen bench men. A man willing to work himself, good prospects for the right man. Address "Foundry," this office.

WANTED—A practical foundryman with about $5,000 to take interest in one of the best manufacturing businesses in the West. Address K, 1537 Williams Street Denver, Colo.

THE FOUNDRY is sorry to learn that fire has recently visited the plant of the Chicago Foundry Suppy Co., Chicago, but we are rejoiced to know that the damage is not as serious as it might have been, as only a small portion of their foundry was destroyed, leaving the balance untouched, together with the large warehouses in which were stored a large stock of the almost innumerable class of goods carried by a first-class foundry establisment.

The Plano Mfg. Co., Plano, Ill., are building a new shop at West Pullman, Ill., and intend employing 1,400 men. At present when they run full force, they employ 700 at Plano. Their new foundry will be 500 feet long and 75 feet wide; they expect to move in September.

John Reardon, well-known in the Lake Superior country having been with the Iron Bay Company at Marquette and Duluth for many years, has taken charge of the foundry, of the Great Western Mfg. Company in Duluth.

AMONG THE FOUNDRIES.

Sanford Bros. at Sheboygan Falls, Wis., have assigned.

The Chicago Foundry Co., have assigned.

The Flathers Foundry Co., will erect a new foundry at Nashua, N. H.

The Smith-Zanesville Foundry Co., are about to remove to Roseville, Ohio.

Crane Bros. have purchased a foundry at Franklin, N. H.

Amos D. Holdaway has purchased the Sun foundry at Provo, Utah, at forced sale.

The new foundry of Schroeder & Sample, Boone, Ia., is about ready for business.

The Jackson Stove Foundry Co., is the name of a new company expected to start in Hammond, Ind.

The Craig-Reynolds Foundry Co., are building another large addition to their plant at Dayton, Ill.

The Quincy Steel Range Co., Quincy, Ill., has been incorporated and will erect a foundry.

Dean Bros. are about to erect a new pump plant in Indianapolis, Ind., to cost $30,000.00.

The Star Foundry at Cincinnati, O., are about to increase the size of their plant.

Hereafter the state of Oregon will operate the foundry at Salem in that state, having refused to renew the contractor's lease and purchased their plant.

The Winnepeg papers have lately been giving considerable prominence to the fact that the C., P. R. R. foundry there has made a large cast iron turn table weighing 5,470 pounds, it being the largest ever cast there.

Blakeslee & Co., who have been operating a foundry near Hainesport, Pa., and were about to remove to Allentown, Pa., have had an attachment issued against them by some of their employees who could not get their wages.

Wainwright Bros. are about to erect a foundry 50x100 ft. at Morris, Ia.

The new foundry of J. H. Bass at Lenoir City, Tenn., will be 122x475 ft.

Stearns, Rogers, & Co., are enlarging their foundry at Pueblo, Col.

The Girard Stove Works and Wallis Foundry at Warren, O., have consolidated.

The Gibson City Iron Works, Gibson City, Ill., have incorporated with a capital stock of $50,000.00 to make hot water and steam radiators.

The Cleveland Steel Casting Co., organized last October, are erecting buildings one 60x260, and the other 35x260, both being of iron and steel.

Wm. Adgar & Son have leased the old confederate foundry in Mobile, Ala., and are going into business on an extensive scale.

Messrs. Butler & Carrol who are going into the foundry business in Hancock, Mich., have excellent prospects, and some solid citizens behind them.

The Black Hills Foundry & Machine Shop at Deadwood, S. D., have got started. Geo. Tooker of Chicago, is in charge of the foundry.

The Crane & Breed Mfg. Co., Cincinnati, O., is enlarging the capacity of its foundry. Among the new machinery contracted for is a 15-ton Ridgway steam hydraulic crane.

J. C. O'Donnel has completed arrangements with Whitewater, Wis., parties and is about to remove to the later place from Sheldon, Ia. A stock company has been formed with $75,000.00 capital.

"Keep's Test" for Cast Iron is a 32-page book which we have received from the author and inventor of tests and whose name they bear. It contains in substance the articles on that subject which appeared in THE FOUNDRY for January, February, March, and April, together with some additional matter. We believe Mr. Keep will send them to any one interested.